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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Robert Andrew Slade

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EXAMINER

MEHTA, PARIKHA SOLANKI

ART UNIT

PAPER NUMBER

3737

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/509,847	Applicant(s) SLADE ET AL.	
	Examiner PARIKHA S. MEHTA	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-9 are objected to because of the following informalities:
In line 2 of claim 1, "operable" should be replaced with --configured--.
In line 2 of claim 2, "may" should be replaced with --are configured to--.
In line 5 of claim 2, "may also" should be replaced with --are also configured to--.
In line 2 of claim 3, "for generating" should be replaced with --configured to generate--.
In line 1 of claim 5, "are made from" should be replaced with --comprise--.
In line 2 of claim 5, "superconductor" should be replaced with --superconductors--.
In line 2 of claim 7, "may" should be replaced with --is configured to--.
In line 2 of claim 8, "may" should be replaced with --is configured to--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 2-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
Claim 2 recites the limitation "the first and second electromagnet's coil positions and turns densities" in line 6. There is insufficient antecedent basis for this limitation in the claim.
Claim 4 recites the limitation "the magnets" in line 2. There is insufficient antecedent basis for this limitation in the claim.
Claim 5 recites "the coils" in line 1. There is insufficient antecedent basis for this limitation in the claim.
Claim 6 recites the limitation "the first and magnets" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.
Claim 6 recites the limitation "the coil positions and densities" in line 1-2. There is insufficient antecedent basis for this limitation in the claim.

Art Unit: 3737

Claim 7 recites the limitation “the magnetic dipole”. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Arenson et al (US Patent No. 6,304,769), hereinafter Arenson ('769), of record.

Regarding claims 1 and 9, Arenson ('769) discloses an imaging and catheter steering assembly and method for using the assembly, the assembly comprising a magnetic field generating assembly operable in a first mode to generate a first external (i.e., “outside the assembly”) magnetic field (col. 3 lines 13-15), and in a second mode to generate a second static field in the working volume suitable for MRI (col. 7 line 55 – col. 8 line 4, col. 10 lines 40-60), and a catheter having a steering coil (i.e., “magnetic seed”) attached whose orientation is determined by interaction with the first magnetic field (col. 3 lines 20-22 & 29-36). Examiner notes that the term “magnetic seed” is interpreted to encompass any passive or active magnetic element known in the art.

Regarding claims 2 and 4, Arenson ('769) discloses the magnetic field generating assembly as comprising multiple (i.e., at least “first and second”) superconducting electromagnets whose currents may be adjusted within a working range including zero and are configured for static (i.e., “relatively uniform”) field generation for imaging (col. 4 lines 58-64, col. 7 lines 55-62).

Regarding claim 7, Arenson ('769) discloses that the steering catheter may be switched off (col. 11 lines 21-25).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 3737

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arenson ('769) in view of Morrone (US Patent No. 6,657,432), hereinafter Morrone ('432).

Arenson ('769) substantially teaches all features of the present invention as previously discussed for claim 2, but does not teach third and fourth magnets configured to generate pulsed magnetic fields with orthogonal linear gradients during imaging and static fields during steering. In the same field of endeavor, Morrone ('432) teaches an MRI system including two magnets configured to generate a field in the Z direction, similar to the magnets of Arenson ('769), as well as third and fourth magnets configured to create adjustable linear gradients in the X and Y directions (col. 4 line 63 – col. 5 line 56). It would have been obvious to one of ordinary skill the art at the time of invention to have modified Arenson ('769) to include the third and fourth gradient coils of Morrone ('432) in order to more precisely control the regions of magnetization of the patient during imaging.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arenson ('769) in view of Breneman et al. (5,412,363), hereinafter Breneman ('363), of record.

10. Arenson ('769) substantially teaches all features of the present invention as previously discussed for claim 4, but does not teach the magnetic field coils as being made from a high temperature superconductor. In the same field of endeavor, Breneman ('363) teaches a superconducting coil formed of high temperature superconductor for MR imaging (col. 5, lines 38-40). It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Arenson ('769) to include high temperature superconductors for the magnetic field coils as taught by Breneman ('363), as such a modification would require nothing more than the mere combination of known elements to yield

Art Unit: 3737

predictable results, which has previously been held as obvious and unpatentable (see for precedent *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arenson ('769) in view of McDougall et al. (5,680,044), hereinafter McDougall ('044), of record.

Arenson ('769) does not explicitly teach the magnets comprising electrical coils capable of exhibiting substantially zero mutual inductance. In the same field of endeavor, McDougall ('044) teaches magnets of a magnetic field generating assembly comprising electrical coils (col. 2, lines 3-5) capable of exhibiting substantially zero mutual inductance (col. 10, lines 51-54).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Arenson ('769) to include magnets comprising electrical coils capable of exhibiting substantially zero mutual inductance in the combined invention, in light of the teachings of McDougall ('044) to enhance the signal-to-noise ratio and to avoid undesirable effects resulting from residual flux leakage.

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arenson ('769).

Arenson ('769) substantially teaches all features of the present invention as previously discussed for claim 7, but does not expressly teach the seed to comprise a semi-hard permanent magnet. Arenson ('769) does teach that the seed may comprise a microcoil wound about a semi-solid substrate, wherein the coil is switched on and off by the application of current, and that the seed may comprise a solenoid (col. 6 lines 6-26). Examiner hereby takes Official Notice that it is well known in the art that solenoids may comprise a coil wound around ferromagnetic material (i.e., a "permanent magnet"). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a coil wrapped around a semi-solid permanent magnet for the solenoid of Arenson ('769), as such a modification would require nothing more than the mere combination of known elements to yield predictable results, which has previously been held as obvious and unpatentable (see for precedent *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385).

Response to Arguments

13. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 3737

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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3737

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